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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,489	07/28/2003	Christopher J. Bulian	S-100,500	7447

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EXAMINER

WARTALOWICZ, PAUL A

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 10/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,489

Applicant(s)

BULIAN ET AL.

Examiner

Paul A. Wartalowicz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 8/14/06 have been fully considered but they are not persuasive.

Applicant argues that Redanz teaches ammonium paratungstate is added to water to form a slurry and this slurry is heated and then added to concentrated hydrochloric acid and that the addition of the slurry to the hydrochloric acid does not result in the production of a solution, but instead results in another slurry and that a slurry has a solid phase and a liquid phase unlike a solution which has only a liquid phase. This argument is not persuasive for the following reasons.

Slurry is encompassed within the scope of solution. Slurry is a colloidal solution wherein particles are suspended in the liquid (water). Redanz teaches "this slurry (water and ammonium paratungstate) was added to...concentrated chemically pure hydrochloric acid...The slurry was agitated in a 4-liter beaker for 2 to 3 hours at a 75-85°C and then allowed to stand for a 24-hour period to settle and cool. The resulting *solution*...". This is some evidence that Redanz discloses a solution comprising water, ammonium paratungstate, and concentrated hydrochloric acid. For at least these reasons, slurry and solution will be treated as equivalent for the purposes of examination. As to the argument of combining the precursor solution (ammonium paratungstate and hydrochloric acid) with water to form a precipitate, when ammonium paratungstate, water, and hydrochloric acid are combined, all three components are present in the prior art (Redanz; col. 2, lines 46-53) as in the claimed invention such that

the prior art teaches that the precursor solution (ammonium paratungstate and hydrochloric acid) are combined with water to form a precipitate.

Applicant argues that in Baresel the addition of hydrochloric acid does not result in the formation of a solution, but instead resulted in the formation of a precipitate and that Baresel also does not teach the preparation of a solution of ammonium paratungstate and hydrochloric acid. This argument is not persuasive for the following reasons.

As to the argument of combining the precursor solution (ammonium paratungstate and hydrochloric acid) with water to form a precipitate, the prior art combines ammonium paratungstate, water, and hydrochloric acid; all three components are present in the prior art simultaneously, after this a precipitate was formed (Redanz; col. 2, lines 46-53) as in the claimed invention such that the prior art teaches that the precursor solution (ammonium paratungstate and hydrochloric acid) are combined with water to form a precipitate because all three components are present simultaneously. Redanz teaches "this slurry (water and ammonium paratungstate) was added to...concentrated chemically pure hydrochloric acid...The slurry was agitated in a 4-liter beaker for 2 to 3 hours at a 75-85°C and then allowed to stand for a 24-hour period to settle and cool. The resulting *solution*...". This is some evidence that Redanz discloses a solution comprising water, ammonium paratungstate, and concentrated hydrochloric acid. This teaching by Redanz meets the limitation of a preparation of a solution of ammonium paratungstate and hydrochloric acid. The invention as claimed

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(for instance, claim 2) uses “comprising” type open language such that water is not excluded for the purposes of examination.

Baresel is not relied upon to teach forming a solution by the addition of concentrated hydrochloric acid. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that applicant's claimed invention does not involve using a solution of, or a slurry of, ammonium paratungstate because the additional water promotes the formation of a precipitate. This argument is not persuasive for the following reasons.

The invention as claimed (for instance, claim 2) uses “comprising” type open language such that water is not excluded for the purposes of examination. The following recitation “comprising preparing a precursor solution comprising ammonium paratungstate and hydrochloric acid” (claim 5, 7) uses “comprising” type open language that does not exclude water being present such that ammonium paratungstate is in the form of a solution or slurry still teaches the invention as claimed.

Applicant points out that although tungstic acid and hydrated tungsten trioxide have the same number and kind of atoms, they are not the same material. This argument is not persuasive for the following reasons.

The claims necessitate that water is combined with a solution of ammonium paratungstate and hydrochloric acid; this is substantially similar to the process of Redanz (solution of water, ammonium paratungstate, and hydrochloric acid, col. 2, lines 50-54). Because the process of the prior art is substantially similar to that of the claimed invention, the product made by said prior art process is substantially similar that of the claimed invention.

Applicant argues that the phrase "finely divided" does not inherently teach nanopowder. Nonosized specifically refers to particles having dimensions less than 1 micrometer and that finely divided can be interpreted as millimeter, micron, or nanosized. This argument is not persuasive for the following reasons.

The recitation: "finely divided" is not relied upon to teach inherency of nanosized particles of tungsten trioxide. However, applicant admits that finely divided is associated with nanosized and because the process of the prior art is substantially similar to that of the claimed invention, the product of said process of prior art is substantially similar to that of the product produced by the process of the claimed invention *including* properties of said product of the claimed invention including size and morphology.

Applicant argues that Sherman does not teach hydrated tungsten oxide and that tungsten oxide and tungsten oxide hydrate oxide hydrate are equivalent materials, nor that tungsten oxide and/or tungsten oxide hydrate particles have a platelet morphology. Sherman lists compounds and shapes, but no correlation between the compounds and shapes. This argument is not persuasive for the following reasons.

Sherman teaches photocatalyst particles having a size of 1 to 100 nanometers made of tungsten oxide having platelet morphology (paragraph 0206, lines 4-5; paragraph 0208, lines 1-3; paragraph 0209, lines 10-13). Sherman lists three preferred compounds and four particle geometries. If Sherman does not inherently teach nanosized particles of tungsten oxide having platelet morphology, one of ordinary skill in the art would recognize that it would be obvious to produce nanosized particles of tungsten trioxide having a platelet morphology based on the desired properties of the end product and that the limited number of combinations from the lists (compounds and geometries) would point one of ordinary skill to the combination of tungsten trioxide having a platelet morphology.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 10 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sherman (U.S. 2002/0005145).

Sherman teaches photocatalyst particles having a size of 1 to 100 nanometers made of tungsten oxide having platelet morphology (paragraph 0206, lines 4-5; paragraph 0208, lines 1-3; paragraph 0209, lines 10-13).

If Sherman does not inherently teach nanosized particles of tungsten oxide having platelet morphology, one of ordinary skill in the art would recognize that it would be obvious to produce nanosized particles of tungsten trioxide having a platelet morphology based on the desired properties of the end product and that the limited number of combinations from the lists (compounds and geometries) would point one of ordinary skill to the combination of tungsten trioxide having a platelet morphology.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Redanz (U.S. 2993755) in view of Baresel et al. (U.S. 3902917).

Redanz teach a process for making tungstic acid (col. 2, lines 54-56) wherein ammonium paratungstate is mixed with chemically pure hydrochloric acid (col. 2, lines 46-52) and then decanted with water in order to form a precipitate of tungstic acid (tungstic acid is hydrated tungsten trioxide, col. 2, lines 53-56). Redanz fails to teach wherein the hydrochloric acid comprises an aqueous solution of about 35-38 weight percent of hydrochloric acid and wherein a method for preparing anhydrous WO₃ nanopowder comprising heating a precipitate of WO₃ H₂O (hydrated tungsten trioxide) at a temperature of 200°C to 400°C.

Baresel et al. teach a process for making finely divided WO_3 (finely divided inherently teaches nanopowder, col. 4, lines 45-48) wherein ammonium tungstate is mixed with concentrated hydrochloric acid (37% HCl by weight, col. 4, lines 30-33) for the purpose of forming tungstic acid hydrate (col. 4, lines 40-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein ammonium tungstate is mixed with concentrated hydrochloric acid (37% HCl by weight, col. 4, lines 30-33) in Redanz in order to form tungstic acid hydrate (col. 4, lines 40-43) as taught by Baresel et al.

As to the limitation wherein a method for preparing anhydrous WO_3 nanopowder comprising heating a precipitate of $\text{WO}_3 \cdot \text{H}_2\text{O}$ (hydrated tungsten trioxide) at a temperature of 200°C to 400°C , Baresel et al. teach wherein precipitated tungstic acid is heated at a temperature of 200°C (col. 4, lines 40-44) for the purpose of expelling the water formed by the dehydration of tungstic acid to produce tungsten trioxide (col. 4, lines 42-46).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein precipitated tungstic acid is heated at a temperature of 200°C (col. 4, lines 40-44) in Redanz in order to expel the water formed by the dehydration of tungstic acid to produce tungsten trioxide (col. 4, lines 42-46).

As to the limitation wherein tungsten trioxide hydrate nanosized particles have a platelet morphology, the combined teachings of Redanz and Baresel et al. teach the limitations of making tungsten trioxide hydrate as claimed such that the tungsten trioxide

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hydrate nanosized particles having a platelet morphology is inherently taught by the combined teachings of Redanz and Baresel et al.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Redanz (U.S. 2993755) in view of Baresel et al. (U.S. 3902917) and Sato et al. (U.S. 3452106).

Redanz teach a process for making tungstic acid (col. 2, lines 54-56) wherein ammonium paratungstate is mixed with chemically pure hydrochloric acid (col. 2, lines 46-52) and then decanted with water in order to form a precipitate of tungstic acid (tungstic acid is hydrated tungsten trioxide, col. 2, lines 53-56). Redanz fails to teach wherein the hydrochloric acid comprises an aqueous solution of about 35-38 weight percent of hydrochloric acid and wherein a method for preparing anhydrous WO_3 nanopowder comprising heating a precipitate of $WO_3 \cdot H_2O$ (hydrated tungsten trioxide) at a temperature of 200°C to 400°C and wherein the WO_3 nanopowder is reacted with hydrogen gas to form WO_2 .

Baresel et al. teach a process for making finely divided WO_3 (finely divided inherently teaches nanopowder, col. 4, lines 45-48) wherein ammonium tungstate is mixed with concentrated hydrochloric acid (37% HCl by weight, col. 4, lines 30-33) for the purpose of forming tungstic acid hydrate (col. 4, lines 40-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein ammonium tungstate is mixed with concentrated hydrochloric acid (37% HCl by weight, col. 4, lines 30-33) in Redanz in order to form tungstic acid hydrate (col. 4, lines 40-43) as taught by Baresel et al.

As to the limitation wherein a method for preparing anhydrous WO_3 nanopowder comprising heating a precipitate of $\text{WO}_3 \cdot \text{H}_2\text{O}$ (hydrated tungsten trioxide) at a temperature of 200°C to 400°C , Baresel et al. teach wherein precipitated tungstic acid is heated at a temperature of 200°C (col. 4, lines 40-44) for the purpose of expelling the water formed by the dehydration of tungstic acid to produce tungsten trioxide (col. 4, lines 42-46).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein precipitated tungstic acid is heated at a temperature of 200°C (col. 4, lines 40-44) in Redanz in order to expel the water formed by the dehydration of tungstic acid to produce tungsten trioxide (col. 4, lines 42-46).

As to the limitation wherein tungsten trioxide hydrate nanosized particles have a platelet morphology, the combined teachings of Redanz and Baresel et al. teach the limitations of making tungsten trioxide hydrate as claimed such that the tungsten trioxide hydrate nanosized particles having a platelet morphology is inherently taught by the combined teachings of Redanz and Baresel et al.

As to the limitation wherein the WO_3 nanopowder is reacted with hydrogen gas to form an oxide of lower valency than WO_3 , Sato et al. teach a process for making tungsten dioxide (oxide of lower valency than WO_3 is WO_2 , col. 5, lines 38-40) wherein tungsten trioxide is exposed to hydrogen gas (col. 5, lines 40-42) for the purpose of making an oxide of a lower valency (oxide of a lower valency inherently teaches WO_2 , col. 5, lines 38-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide tungsten trioxide is exposed to hydrogen gas (col. 5, lines 40-42) in Redanz in order to make an oxide of a lower valency (oxide of a lower valency inherently teaches WO₂, col. 5, lines 38-43).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

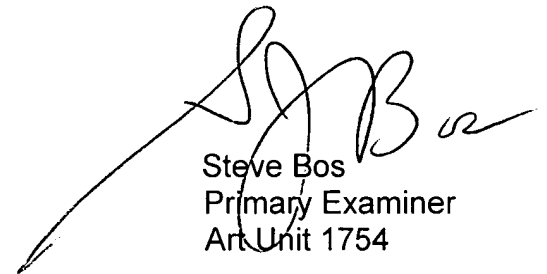
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Wartalowicz whose telephone number is (571) 272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Paul Wartalowicz
October 18, 2006



Steve Bos
Primary Examiner
Art Unit 1754